

PHOTOTHERMAL DETECTION OF NUCLEIC ACID HYBRIDIZATION

Abstract

5 A nucleic acid hybridization detection assay is carried out at a solid surface. Capture probes comprising single-stranded oligonucleotides are immobilized to a solid substrate surface. In some embodiments using sandwich assay methodology, the capture probes hybridize complementary target nucleic acid sequences, which in turn are bound to detection probes
10 comprising nanoparticle-oligonucleotide conjugates comprising target-complementary oligonucleotides. In some embodiments, detection probes comprise nanoparticles attached to molecules comprising one partner of a ligand-binding pair (e.g., streptavidin), while target sequences comprise the other partner of the ligand-binding pair (e.g., biotin). The solid surface is
15 exposed to light at a wavelength that is absorbed by the nanoparticle, thus eliciting a temperature jump. The heat generated by the nanoparticle excitation is detected by a photothermography method such as infrared thermography.